



(19)

(11) Publication number: 04096222 A

Generated Document.

## PATENT ABSTRACTS OF JAPAN

(21) Application number: 02207134

(51) Int'l. Cl.: H01L 21/302

(22) Application date: 03.08.90

(30) Priority:

(43) Date of application 27.03.92  
publication:(84) Designated contracting  
states:

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(54) MANUFACTURE OF  
SEMICONDUCTOR DEVICE

## (57) Abstract:

PURPOSE: To perform etching of an Si oxide film and an Si nitride film by a dry method without damaging a substrate by etching the Si oxide film and the Si nitride film by exposing these to F-group gas containing specific atoms, and mixed gas of aforesaid F-group gas and H<sub>2</sub>O, H<sub>2</sub>.

CONSTITUTION: Etching of an Si oxide film 3 and an Si nitride film 4 is performed by exposing these to F-group gas containing F-atoms of HF, F<sub>2</sub>, XeF<sub>2</sub> and to mixed gas of aforesaid F-group gas and H<sub>2</sub>O, H<sub>2</sub>. Etching of a nitride film, an oxide film is performed according to an etching property, thickness of semiconductor constitution materials such as single Si, polySi, a nitride film, an oxide film and the kinds of F-group gas, and the materials around them are made to remain. During an etching process, ultraviolet light is directly applied to F-group gas or a substrate 1. After the etching process, annealing is performed. After etching or annealing processes, again a film 6 is formed. Directly before finishing the etching process, F-group gas is changed to F-group gas having low etching speed of the semiconductor substrate.

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